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I further certify that the above application is now proceeding in the name of VEND- TECH SOLUTIONS HOLDINGS PTY LTD pursuant to the provisions of Section 113 of the Patents Act 1990.

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DISPENSING MACHINE

FIELD OF THE INVENTION

The present invention relates to dispensing machines and in particular to vending machines for dispensing goods in response to a customer tendering payment for the goods.

BACKGROUND ART

At the moment, the majority of Australian retailers provide non-biodegradable plastic carry bags which end up as landfill or litter. Some of these bags are recycled at supermarket collection bins, but this is only a very small percentage of the total number of bags used.

Each year Australians throw away six billion plastic bags. That's 12,000 bags a minute, most discarded after one use.

The plastic bags clog waterways and kill thousands of sea birds, sea mammals and fish each year. Turtles, dolphins and killer whales mistake them for jellyfish and die of intestinal blockage.

Bags contaminate kerbside recycling, can remain undegraded in the environment for up to 1000 years, and cause problems for landfill.

There has been debate on the use of plastic bags but little action. The major supermarket chains have adopted the policy of asking customers if they need a bag. They have designed calico bags, and tried box systems.

The momentum for change is building. Ireland's €15 cent (26 cents) plastic bag tax, introduced in March 2002, has cut the number of discarded bags by 95 per cent.

Federal Ministers in some countries have warned that if consumers do not cut down on plastic bags they will consider imposing a tax or levy on them.

Recent surveys have shown that about 70 per cent of consumers worry that plastic bags harm the environment.

There are alternatives. One is the biodegradable plastic bag, which has cobalt in it. The cobalt breaks down the plastic within one and three years. Another is corn starch bags that biodegrade in four to six weeks.

There are various systems available for dispensing goods purchased from vending machines.

One such system is provided for vending products such as beverage and other food products, preferably individually packaged, from a storage unit to a customer terminal at a remote location through a pneumatic tube conveyor to move the product from storage to a dispensing unit at the remote location in response to product selection made by a customer at the remote location. For example, the system may sell food, beverages or vehicle care products to customers at a fuel dispensing station by charging to a fuel charge system having a credit card reader associated with a self-service fuel pump to process the fuel purchase charge. The product is preferably moved through the conveyor in a reusable carrier or in its own product packaging container that serves as a carrier.

Another system uses an existing product vending machine as a storage and loading device for use in a pneumatic vending and delivery system along with an interface unit in place of the vending machine door. A product dispensing terminal is connected by the delivery tube of a pneumatic conveyor from the storage and loading device, which has a loading mechanism configured to load a product dispensed by the dispensing mechanism into the delivery tube. The pneumatic conveyor includes a back pressure source operable to apply reverse pressure to a product in the delivery tube to gently slow a product approaching the product dispensing terminal through the tube. A gate is selectively moveable into and out of the path of a product proximate the outlet end of the delivery tube to stop a product slowed by the back pressure source and to release the stopped product for delivery to a customer at the product dispensing terminal. The loading mechanism includes a moveable member connected at one end to a blower and having an open end configured to receive a product dispensed by the dispensing mechanism and to seal the inlet end of the delivery tube with the received product positioned between the blower and the tube. The moveable member is preferably a bucket shaped element pivotally mounted to move between an open position for receiving a product dispensed by the dispensing mechanism and a closed position sealing the inlet to the deliver

tube.

Bag and sack storage dispensers are also known. These generally have a housing that is secured to a mounting surface, preferably on the interior of a kitchen cabinet door. The housing has an integral frame that supports sacks or bags or other planar items during storage. The frame depends from a vertical base that mounts directly to the mounting surface. A horizontal support panel extends outwardly from the door and base. An auxiliary support panel may also extend outwardly from the door and the base. The auxiliary panel extends parallel to but beneath the primary support panel. Each panel has at least one elongated slot penetrating its surface, although there may be more. The slots preferably run parallel to one another and perpendicularly intersect the base. An elongated leg protrudes outwardly from each slot toward the base. Each leg has a foot on one end that secures the leg to the panel. The foot comprises a follower that moves in the slot. The other leg end comprises a terminal, resilient end that is oriented toward the cabinet door or other base attachment surface. A biasing assembly ensures that each leg is normally biased toward the cabinet door or other base attachment surface.

Simpler dispensers are known. One such dispenser is a dispenser having a top surface and a front surface with a cut-out extending between the front and top surfaces with slits extending from sides of said cut-out along the front surface. A stack of plastic bags or plastic sheet pick-up tissues are arranged in the dispenser and are dispensed by grasping an uppermost one via the cut-out and pulling outward with the bags being pulled one at a time through the cut-out and slits.

There are also automatic bag systems for supermarket check-out counters. These machines generally have some form of heat sealer for operation in relation to plastic rolls which form a bag around items positioned within the machine.

All of the above dispensers generally dispense plastic bags. As described above, these bags cause or contribute to an environmental problem. None of the above dispensers are adapted to dispense paper bags.

SUMMARY OF THE INVENTION

The present invention is directed to a dispensing machine, which may at least partially overcome the abovementioned disadvantages or provide the consumer with a useful or commercial choice.

5 In one form, the invention resides in a dispensing machine for dispensing paper bags comprising a housing having an interior and an exterior, a storage compartment for storing paper bags located in the interior of the housing, a dispensing compartment accessible from the exterior of the housing, suction means positioned to allow movement between the storage
10 compartment and the dispensing compartment, the suction means adapted to grasp the paper bags stored in the storage compartment, hold the paper bags during movement and release the paper bags into the dispenser compartment, and control means to control the movement of the suction means.

15 In another form, the invention resides in a paper bag dispensing machine comprising a housing having an interior and an exterior, a storage compartment for storing paper bags located in the interior of the housing, a dispensing compartment accessible from the exterior of the housing, means for moving the bags positioned to allow movement between the storage
20 compartment and the dispensing compartment, the moving means adapted to grasp the paper bags stored in the storage compartment, hold the paper bags during movement and release the paper bags into the dispenser compartment, and control means to control the movement of the movement means.

25 In use, the machine may be located in a supermarket and users may approach the machine to inset money. This will activate the suction means which will then move to dispense the number of bags that the user has paid for. The tendering of money or payment by the user may activate a dispensing cycle. The machine is particularly directed towards the dispensing
30 of paper bags as they are more rigid than plastic bags which are likely to be deformed and perhaps even destroyed by the suction means. Plastic bags may also cause the suction means to clog.

The housing may preferably be rectangular in configuration, having a front wall, two opposed sidewalls, a rear wall, a base and a top wall. The front wall may be at least partially see-through to allow a user to watch the workings of the machine. At least part of the front wall may suitably be see-through.

5 The housing may typically be manufactured from a lightweight but strong material such as metal except obviously the see-through portions. These may be made of engineering plastics to maintain strength but remain see-through.

10 At least one of the rear wall or side walls may suitably have an access panel or door to allow access to the interior of the machine. This may be necessary for service of the machine or for loading of the bags. The door may suitably be hinged and may occupy the whole or only part of the wall. The door may be securable against theft and so may be lockable. There may be more than one door. Generally, for example, there may be a door or
15 access panel to allow a user to access the dispensing compartment. This door is not necessarily positioned on the rear or side walls and most preferably is on the front wall of the housing. This door is preferably only openable during the dispensing cycle and is secured at all other times.

20 The housing may comprise one or more reinforced portion to reduce damage suffered by the housing and also to increase the security of the machine. As an example, the corners of the housing may be reinforced to prevent damage to them, or the housing may be reinforced around any access panels to facilitate locking the housing.

25 The housing may suitably be on wheels or castors to allow the machine to be moved more easily. The wheels may be securable to prevent the machine moving when movement is not desired. Securable wheels of this kind are well known and any type may be used.

30 The housing may also be equipped with lifting lugs to allow movement by cranes or forklifts, for example. It is envisaged that the machine may be rather heavy and lifting lugs may be desired.

 The storage compartment may suitably be rectangular or bin-like in shape with an open top into which the suction means may extend. There may be more than one storage compartment in each machine and in this

case the storage compartments may contain different size bags.

The storage compartment may suitably be shaped to suit the shape of the bags to be stored and dispensed. It is envisaged that a number of different shape bags may be used in conjunction with the machine.

5 Part of the storage bin may suitably be seen through so that an indication of the inventory of bags disposed therein may be taken from outside the machine. The remainder of the storage compartment may generally be manufactured from a strong material such as metal.

10 The storage compartment may suitably not engage the bags closely. The walls of the compartment may be spaced a small distance from the periphery of the bags. The spacing may suitably not be so great that the bags are moved out of alignment while being moved.

15 In a particularly preferred embodiment, the storage compartment may comprise a base, a front and an opposed rear wall and two opposed side walls. The base may have a movable base or a movable plate positioned above the base which can move up and down. The bags may suitably be placed on this moveable plate during loading of the storage compartment. This moveable plate may move upward as the bags are used through provision of a spring or other type of resilient means. The movement of the

20 plate may be controlled. The plate may be moved upward in small increments as bags are dispensed to allow a bag to always be in position for engagement with the suction means until the storage compartment is empty.

The moveable plate may move the bags towards the suction means.

25 In another embodiment, the base may be fixed and the suction means may be movable within the storage compartment to the bags. In this embodiment, the suction means may have an extendible arm member to allow the movement within the storage compartment.

30 The movable plate in the storage compartment may suitably be moved utilizing compressed air or pneumatically. Other methods of movement are envisaged such as hydraulics. A pneumatic ram may suitably be used for the movement of the plate.

The storage compartment may be removable from the housing.

This may allow the storage bin to be loaded with bags more easily and thereby facilitate refilling. The storage compartment may be on wheels which may be securable to prevent any undesirable movement of the storage compartment.

5 The bags with which the storage compartment is loaded may be disposed in a horizontal, flattened position. This position may allow the suction means to grasp and hold the bags more easily.

10 The dispensing compartment may suitably be positioned adjacent to the storage compartment within the housing. It may be positioned such that the bags disposed within the storage compartment cannot be reached through any access door in the housing. This may prevent theft of the bags.

15 The access door to the dispensing compartment may only be opened as a part of the dispensing cycle. At all other times the access door may be secured with the last step in the dispensing cycle being the securing of the access door in the closed position. Preferably, the dispensing cycle may not start while the access door is opened. There may suitably be a "cutout" switch to prevent operation of the machine while the door is opened.

20 The dispensing compartment may be shaped to allow the bags positioned therein to be readily accessible to a user upon opening the access door. In a particularly preferred embodiment, the dispensing compartment may triangular prism shaped, having two opposed sidewalls, each shaped as a right-angled triangle. The sidewalls may be joined by a rectangular wall joining the hypotenuse of each triangular sidewall. An access opening may be positioned in lieu of the remaining wall. This access opening may be sealed by the access door to the dispensing compartment.

 The rectangular wall joining the hypotenuse of each triangular sidewall may be disposed towards the base of the housing to allow any bags within the dispensing compartment to be directed downwardly and forwardly.

30 The suction means may preferably comprise a pneumatically operable suction cup. The suction cup may suitably be manufactured from a resilient material such as rubber.

 As stated earlier, the engagement of the suction means with the

bags may be through the paper bags being moved to the suction means or the suction means moved to the paper bags. The suction means may be moved to the paper bags utilizing an extendible arm member to reach into the storage compartment. The extendible arm member may be extended due to
5 the operation of a pneumatic ram. The pneumatically operable suction cup may be located at the end of the extendible arm member.

The suction means may suitably be associated with a track or some other type of guide means to allow easy movement between the storage and the dispenser compartments. The track or guide means may be
10 equipped with stops at the extremities of movement to prevent movement outside these bounds. The suction means may suitably be capable at multiple points along the track. Aspects of the position and movement of the suction means may suitably be controlled.

The control means may suitably be associated with a means for
15 accepting payment for the bags. The control means may be separate from the means for accepting payment but in use the two may be connected to allow the control means to start the dispensing cycle once the payment has been made.

The means for accepting payment may be capable of accepting
20 payment in the form of credit card, Electronic Funds Transfer (EFT), coins, notes or any combination of these. The means for accepting payment may suitably be capable of recognizing the denomination of payment and giving change if required.

The control means may allow the user of the machine to select
25 the size of the bag required if the machine has more than one size bag contained therein.

The control means preferably controls all of the moving parts of the machine including the suction means, the moveable plate in the storage compartment (if applicable), the extendible arm associated with the suction
30 means (if applicable), the means for accepting payment and giving change, opening of the access door to the dispensing compartment and the power source for the machine including the source of the air used in the pneumatics of the machine.

The control means may also control the movement and position of the suction means preferably through a feedback control loop.

The control means may suitably control the machine so that the tasks required to dispense a bag are performed in the desired format or order to accomplish the dispensing of the bag. The control means may suitably be a Programmable Logic Controller (PLC).

The control means may preferably include a MODEM in communication with a digital counting means. This feature may suitably allow monitoring of the level of inventory in the form of bags in each dispensing machine from a remote location. The remote location may be a central location adapted to monitor the number of bags in a number of machines spread over an area.

Each dispensing machine may preferably be equipped with an inventory level indicator.

The dispensing machine is preferably coin operated and includes control means which activates the suction means and any other internal workings of the dispensing machine in response to indication of receipt of the correct amount of money.

A pneumatic system is preferably utilised to control movement of paper bags from the storage compartment to the dispensing compartment.

The pneumatic system suitably includes a compressor which is activated responsive to sensing of receipt of payment of proper denomination and which may remain operable throughout each cycling of the machine.

The bags which may be used in the machine may be of any type suitable for flat packing. The bags may be of any size or type of paper, for example small, medium or large bags, bags with integral handles, and wax-lined bags for damp and/or cold foodstuffs.

In another form the invention resides in a method for dispensing paper bags from a dispensing machine comprising the steps of providing a plurality of paper bags in a storage compartment, accepting payment for the paper bags from a user, operating a suction means positioned to allow movement between the storage compartment and a dispensing compartment to grasp the paper bags stored in the storage compartment, the suction

means holding the paper bags during movement and the suction means releasing the paper bags into the dispenser compartment for collection by the user.

The step of accepting payment may occur at any stage in the process and the payment may even be performed remotely.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will be described with reference to the following drawings, in which:

Figure 1 is a perspective view of the dispensing machine showing the internal workings.

Figure 2 illustrates an example of the bags to be used in the dispensing machine according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

According to an aspect of the invention, a dispensing machine 10 is provided.

The dispensing machine 10, as illustrated in Figure 1 comprises a housing 11 having an interior and an exterior. A storage compartment 12 for storing paper bags 13 is located in the interior of the housing, 10 towards the front of the machine. A dispensing compartment 14, accessible from the exterior of the housing 11, is positioned adjacent the storage compartment 12. Suction means 15 is positioned above the storage compartment 12. The suction means 15 allows movement between the storage compartment 12 and the dispensing compartment 14. The suction means 15 is adapted to undergo a dispensing cycle in which it grasps the paper bags 13 stored in the storage compartment 12, holds the paper bags 13 during movement from the storage compartment 12 to the dispensing compartment 14 and releases the paper bags 13 into the dispenser compartment 14. Control means 16 is provided to control the movement of the suction means 15.

The housing 11 is rectangular, having a front wall 17, two opposed sidewalls 18, 19, a rear wall 20, a base 21 and a top wall 22. At least part of the front wall 17 is see-through to allow a user to watch the workings of the machine 10.

The rear wall 20 has an access panel 22 to allow access to the

interior of the machine 10. This is to allow for service of the machine or for loading of the bags 13. The access panel 22 is hinged and occupies the whole of the rear wall 20. The access panel 22 is securable against theft and is lockable.

5 There is also an access door 23 to allow a user to access the dispensing compartment 14. This access door 23 is positioned on the front wall 17 of the housing 11. This access door 23 is only openable during the dispensing cycle and is secured at all other times.

10 The housing 11 is reinforced around the access panel 22 and door 23 to facilitate locking the housing 11.

 The housing 11 is on wheels (not shown) to allow the machine 10 to be moved more easily. The wheels are securable to prevent the machine moving when movement is not desired.

15 The storage compartment 12 rectangular with an open top into which the suction means 15 extends. There is more than one storage compartment 12 in the machine shown in Figure 1 and in this case the storage compartments 12 may contain different size bags 13.

 The storage compartment has a base, a front and an opposed rear wall and two opposed side walls.

20 In the embodiment illustrated in Figure 1, the base is fixed and the suction means 15 is movable within the storage compartment 12 to the bags 13. In this embodiment, the suction means 15 has an extendible arm member 24 to allow the movement within the storage compartment 12.

25 The storage compartment 12 is removable from the housing 11. This allows the storage compartment 12 to be loaded with bags 13 more easily.

 The bags 13 with which the storage compartment 12 is loaded are disposed in a horizontal, flattened position. This position allows the suction means 15 to grasp and hold the bags 13 more easily.

30 The dispensing compartment 14 is positioned adjacent the storage compartment 12 within the housing 11.

 The access door 23 to the dispensing compartment 14 can only be opened as a part of the dispensing cycle. At all other times the access

door 23 is secured with the last step in the dispensing cycle being the securing of the access door 23 in the closed position. The dispensing cycle may not start while the access door 23 is opened.

5 The dispensing compartment 14 is triangular prism shaped, having two opposed sidewalls 25, each shaped as a right-angled triangle. The sidewalls 25 are joined by a rectangular wall joining the hypotenuse of each triangular sidewall 25. An access opening 26 is positioned in lieu of the remaining wall. This access opening 26 is sealed by the access door 23 to the dispensing compartment 14.

10 The rectangular wall joining the hypotenuse of each triangular sidewall 25 is disposed towards the base of the housing 11 to allow any bags 13 within the dispensing compartment 14 to be directed downwardly and forwardly.

The suction means 15 is a pneumatically operable suction cup
15 27. The suction cup 27 is manufactured from rubber.

The suction cup 27 is moved to the paper bags utilizing an extendible arm member 24 to reach into the storage compartment 12. The extendible arm member 24 is extended due to the operation of a pneumatic ram. The pneumatically operable suction cup 27 is located at the end of the extendible
20 arm member 24.

The suction means 15 is associated with a guide track 28 to allow easy movement between the storage 12 and the dispenser compartments 14. The guide track 28 is equipped with stops at the extremities of movement to prevent movement outside these bounds.

25 The control means 16 is associated with a means for accepting payment 29 for the bags 13. The control means 16 is connected to the means for accepting payment 29 to allow the control means 16 to start the dispensing cycle once the payment has been made.

The pneumatic system operating the suction cup 27 and the
30 extendible arm member 24 includes a compressor 30 which is activated responsive to sensing of receipt of payment of proper denomination and which may remain operable throughout each cycling of the machine.

The bags 13, an example of which is illustrated in Figure 2, may

be of any type suitable for flat packing. The bags can be of any size or type of paper, for example small, medium or large bags, bags with integral handles 31, and wax-lined bags for damp and/or cold foodstuffs.

5 In the present specification and claims, the word "comprising" and its derivatives including "comprises" and "comprise" include each of the stated integers but does not exclude the inclusion of one or more further integers.

10 In compliance with the statute, the invention has been described in language more or less specific to structural or methodical features. It is to be understood that the invention is not limited to specific features shown or described since the means herein described comprises preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims appropriately interpreted by those skilled in the art.

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Dated this 11th day of October 2002

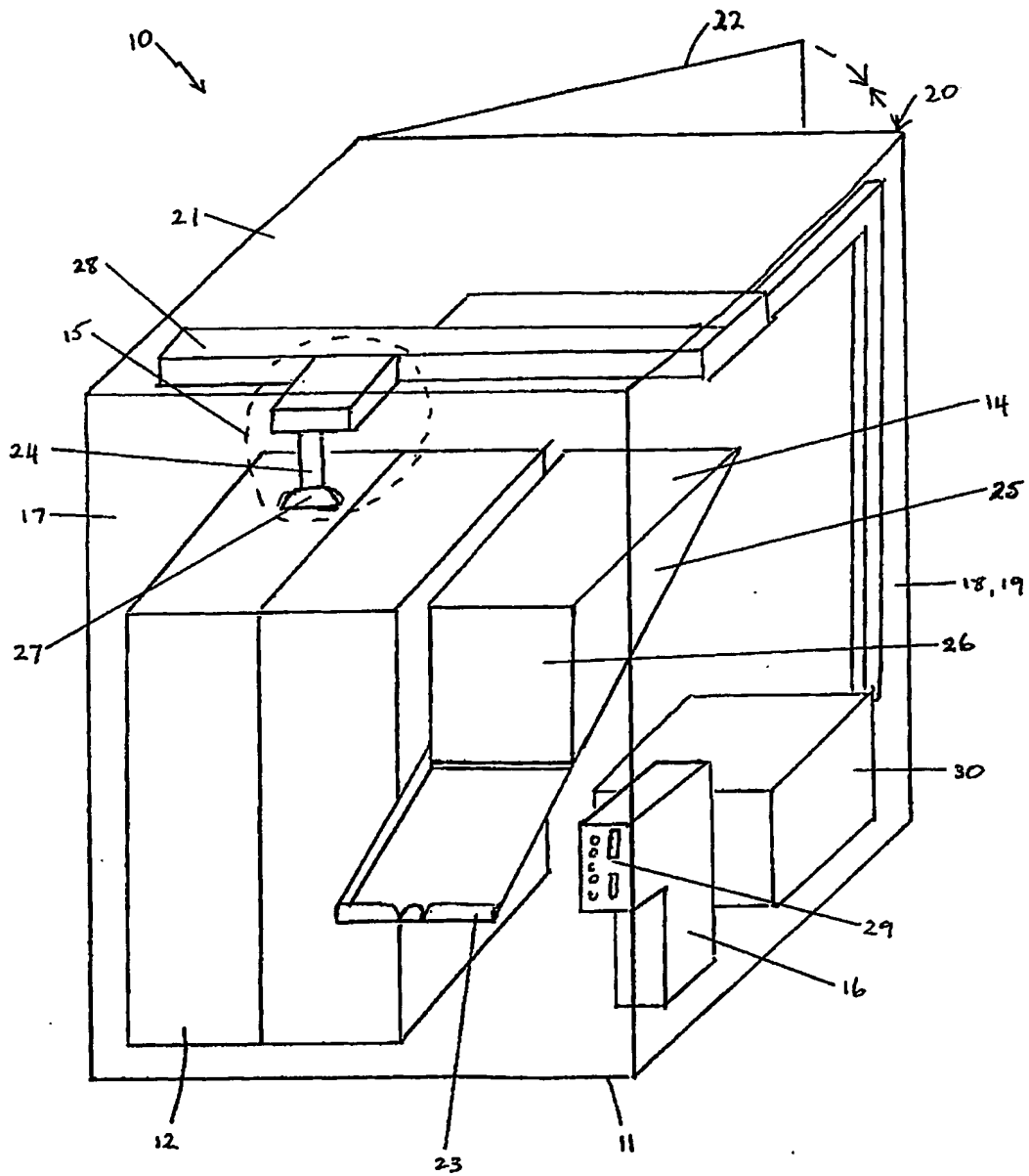
Stephen William Erwin

By his Patent Attorneys

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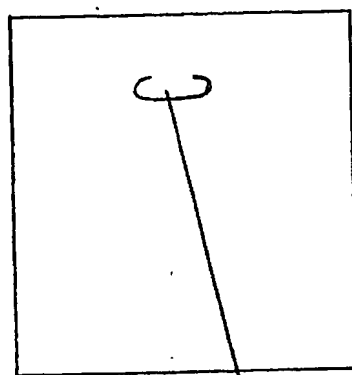
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FIGURE 1

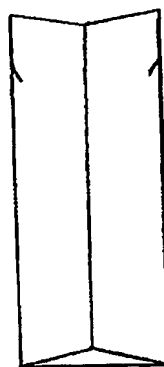


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FIGURE 2



31



13

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